

Having described the invention the following is claimed:

1. An apparatus comprising an inflatable vehicle occupant protection device and a gas generating material that, when ignited, produces gas to inflate the inflatable vehicle occupant protection device, the gas generating material comprising:

an inorganic salt oxidizer; and

a polyurethane thermoplastic elastomer, said polyurethane thermoplastic elastomer comprising a physically cross-linked linear block copolymer of an aromatic diisocyanate and a linear energetic polymer with a hydroxyl functionality of two or less.

2. The apparatus of claim 1 wherein the linear block copolymer is physically cross-linked by hydrogen bonds.

3. The apparatus of claim 1 wherein the aromatic diisocyanate is 4,4'-methylene bis-phenylisocyanate.

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4. The apparatus of claim 1 wherein the linear energetic polymer is glycidyl azide polymer with a hydroxyl functionality of two or less.

5. The apparatus of claim 4 wherein the glycidyl azide polymer has molecular weight from about 25,000 g/mole to about 35,000 g/mole and a hydroxyl functionality of about 2.

6. The apparatus of claim 1 wherein the inorganic salt oxidizer is selected from the group consisting of alkali metal nitrates, alkaline earth metal nitrates, alkali metal perchlorates, alkaline earth metal perchlorates, ammonium perchlorate and ammonium nitrate.

7. The apparatus of claim 1 wherein the inorganic salt oxidizer is phase stabilized ammonium nitrate.

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8. The apparatus of claim 1 wherein the gas generating material further comprises a supplemental fuel.

9. The apparatus of claim 8 wherein the supplemental fuel is cyclotrimethylentrinitramine.

10. The apparatus of claim 1 wherein the inorganic salt oxidizer and the gas generating material are present in a weight ratio adjusted to produce, upon combustion, a gas that consists essentially of carbon dioxide, nitrogen, and water.

11. The apparatus of claim 1 wherein the gas generating material is a resilient solid capable of withstanding shock without permanent deformation at 85°C and not brittle at -40°C.

12. The apparatus of claim 1 wherein the polyurethane thermoplastic elastomer comprises a thermoplastic segment and elastomeric segment.

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13. The apparatus of claim wherein the weight % of the thermoplastic segment in the polyurethane thermoplastic elastomer is 20% to about 40%.

14. A method of preparing a body of gas generating material comprising the steps of:

forming a solution of a polyurethane thermoplastic elastomer and a organic solvent, said polyurethane thermoplastic polyurethane elastomer comprising a physically cross-linked copolymer of an aromatic diisocyanate and a linear energetic polymer with a hydroxyl functionality of two or less;

adding an inorganic salt oxidizer to said solution to form a viscous slurry;

extruding said viscous slurry to form the body of gas generating material;

evaporating the organic solvent from said body of gas generating material.

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15. The method of claim 14 wherein the aromatic diisocyanate is 4,4'-methylene bis-phenylisocyanate.

16. The method of claim 14 wherein the polyurethane thermoplastic elastomer is physically cross-linked by hydrogen bonds.

17. The method of claim 14 wherein the linear energetic polymer is glycidylazide polymer with a molecular weight from about 25,000 g/mole to about 35,000 g/mole and a hydroxyl functionality of about 2.

18. The method of claim 14 wherein the inorganic salt oxidizer is phase stabilized ammonium nitrate.

19. The method of claim 14 wherein the organic solvent is ethyl acetate.

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